## Space Weather Forecast

Issued on Tuesday, 09 July 2024 at 01:23 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Isolated Moderate-class flares likely.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Solar activity has been Moderate with a solitary low level Moderate class flare from a region at, or close to the southeast limb. There are eight sunspot regions on the disc. The largest region is located in the southeast, indicating moderate size and complexity, though has simplified in its magnetic structure somewhat during the period. The remaining regions on the disc appear small, magnetically simple and evolve slowly, however, two returning regions have appeared in the far southeast. At least one region indicates moderate complexity, however confidence in classification of both regions will improve they rotate further onto the visible disc. A region the in the northern hemisphere has rotated out of view over the western horizon.

No Earth-directed Coronal Mass Ejections (CMEs) have been observed during the past 24 hours.

**Solar Wind / Geomagnetic Activity:** Solar winds peaked at slightly elevated levels of 438 km/s at 08/1455 UTC possibly as a result of a weak connection to the fast wind of a coronal hole in the northwest. Since then, solar winds have been on a slow decline back to current normal background levels of around 370 km/s. The Interplanetary Magnetic Field was largely weak, but increased to moderate levels from approximately 08/0755-1250 UTC. The important north-south component varied weakly throughout.

The resulting geomagnetic activity was Quiet to Unsettled (Kp1-3).

**Energetic Particles / Solar Radiation:** Solar radiation was measured at background levels.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Solar activity is expected to be Low to Moderate, with isolated Moderate-class flares likely and a very slight chance of activity increasing to High levels resulting from a risk of isolated Strong flares. Flare risks may be revised as the new regions in the far southeast rotate into clearer view on the visible disc in the coming days.

**Solar Wind / Geomagnetic Activity:** No Earth-directed CMEs feature in the forecast. The solar wind is most likely to be at slow-ambient and perhaps briefly at slightly elevated levels on day 1 (10 Jul), owing to minor fast wind influences from a coronal hole in the northwest disc. Two moderately sized coronal holes in the southwest disc could produce slightly elevated to elevated wind speeds between days 2-4 (10-12 Jul). However, any geomagnetic response from either, or both of these two coronal holes is likely to be muted due to Earth's proximity to the solstice.

Geomagnetic activity is expected to be mainly Quiet to Unsettled through the period, but with a chance of isolated Active intervals on day 2 and 3 (10 and 11 Jul) due to anticipated fast wind influence.

**Energetic Particles / Solar Radiation:** Solar radiation storms are not expected, but there is a

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very slight chance of reaching S1/Minor Radiation Storm or greater levels. This risk increases a little later in the period as AR3738, currently in the southeast, rotates towards centre disc and into a more geoeffective position.

**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 1 | 5 | 5 | 1 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | Yes | 50 | 50 | 50 | 50 |
| Very Active | R3 to R5 X | No | 5 | 5 | 5 | 5 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 5 | 5 | 10 | 10 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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